

Remarks.

1. Claims 1-29, 31-34 are presently pending.
2. The Examiner has rejected claims 1-34 under 35 U.S.C. 112, second paragraph.
3. The Examiner states that claims 1-2, 5-7, 9-11, 13-15, 17, 19, 21-28 contain improper Markush groups.

Applicants have amended these claims to correct the language for the proper Markush terminology of "selected from the group consisting of". Accordingly, applicants request favorable reconsideration of 1-2, 5-7, 9-11, 13-15, 17, 19, 21-28.

4. The Examiner states that in claims 29, 31-34, x is undefined, rendering the claims indefinite.

Applicants have amended claim 29 to contain the limitation of claim 30 which defines the value of x. Claim 29 has also been amended to correct for the lack of antecedent basis for "the formula". Accordingly, applicants request favorable reconsideration of claim 29, and claims 31-34 which depend therefrom.

5. Claim 3 has also been amended as the Examiner suggested to recite "up to 5%."

6. The Examiner has rejected claims 1-34 under 35 U.S.C. 102(b) or in the alternative under 35 U.S.C. 103(a) in view of Dettling ('306).

7. Applicants respectfully submit that in regard to the Examiner's rejection under 35 U.S.C. 102(b), "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegall Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 11226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). *MPEP 2131.*

8. The Examiner states that in regard to claims 1, 29, Dettling discloses a catalyst comprising a support of ceria and lanthana impregnated with platinum, and honeycomb substrates.

Applicants respectfully submit that Dettling teaches a catalyst comprising a zirconia and/or lanthana stabilized ceria support, platinum and palladium, and an alumina binder. Col. 3, lines 58-65. Dettling, however, does not disclose a catalyst comprising at least one metal oxide impregnated with at least one noble metal, the metal oxide selected from the group consisting of  $Fe_2O_3$ ,  $Cr_2O_3$ ,  $MgO$ ,  $ZnO$ ,  $TiO_x$ , wherein x is less than 2, a combination of  $Fe_2O_3$  and  $La_2O_3$ , and a combination of  $Fe_2O_3$  and  $CeO_2$ , the noble metal selected from the group consisting of Pt, Pd, Ir, Rh, and Ru, as is required in the present invention. Therefore, claim 1 is not anticipated by Dettling. Accordingly, applicants request favorable reconsideration of claim 1 under 35 U.S.C. 102(b).

Claim 29 requires a catalyst comprising a rare earth metal, a transition metal and a noble metal forming a compound having a stoichiometry represented by the formula  $AB_{1-x}M_xO_3$ , where x is 0-0.3. Dettling teaches a catalyst comprising a zirconia and/or lanthana stabilized ceria support, platinum and palladium, and an alumina binder. Col. 3, lines 58-65. Dettling does not teach a catalyst having the limitations required by claim 29. Therefore, claim 29 is not anticipated by Dettling. Accordingly, applicants request favorable reconsideration of claim 29 under 35 U.S.C. 102(b).

9. The Examiner states in regard to claims 2 and 5, that Dettling discloses 0.1 g/in<sup>3</sup> nickel.

Applicants request favorable reconsideration of claims 2 and 5, for the reasons given above for claim 1, from which they depend.

10. The Examiner states in regard to claims 3-4 and 33, that Dettling discloses 1% Pt and Pd.

Applicants request favorable reconsideration of claims 3-4 and 33, for the reasons given above for claims 1 and 29, from which they depend.

11. The Examiner states in regard to claims 6-28, that Dettling discloses 3% lanthana and baria.

Applicants request favorable reconsideration of claims 6-28, for the reasons given above for claim 1, from which they depend.

12. The Examiner states in regard to claims 30, 31, that Dettling discloses  $La_2O_3$  plus ceria.

Claim 30 has been canceled.

Applicants request favorable reconsideration of claim 31 for the reasons given above for claim 29, from which it depends.

13. The Examiner states in regard to claim 32, that Dettling discloses manganese.

Applicants request favorable reconsideration of claim 32, for the reasons given above for claim 29, from which it depends.

14. The Examiner states in regard to claim 34, that Dettling discloses 1% Pt, 3% lanthana and manganese.

Applicants request favorable reconsideration of claim 34, for the reasons given above for claim 29, from which it depends.

15. In regard to the Examiner's rejection of claims 1-34 under 35 U.S.C. 103(a) in view of Dettling, applicants respectfully submit that the Examiner has failed to meet the burden of establishing a *prima facie* case of obviousness. In order to meet the burden of establishing a *prima facie* case of obviousness the Examiner must show (1) "some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings", (2) "a reasonable expectation of success", and (3) that "the prior art reference (or references when combined) must teach or suggest all the claim limitations." *MPEP* § 2143. "It is insufficient that the prior art disclosed the components of the patented device, either separately or used in other combinations; there must be some teaching, suggestion or incentive to make the combination made by the inventor." *Northern Telecom, Inc. v. Data Point Corp.*, 15 USPQ 2nd 1321, 1323 (Fed. Cir. 1990).

Applicants respectfully submit that the Examiner has provided no suggestion or motivation for modifying Dettling to obtain the claimed invention which requires catalyst comprising at least one metal oxide impregnated with at least one noble metal, the metal oxide selected from the group consisting of  $Fe_2O_3$ ,  $Cr_2O_3$ ,  $MgO$ ,  $ZnO$ ,  $TiO_x$ , wherein x is less than 2, a combination of  $Fe_2O_3$  and  $La_2O_3$ , and a combination of  $Fe_2O_3$  and  $CeO_2$ , the noble metal selected from the group consisting of Pt, Pd, Ir, Rh, and Ru. Further, as discussed above, Dettling does not disclose all the claim limitations of claims 1-29, 31-34, and therefore there cannot be a reasonable expectation of success in obtaining the present invention by following the teachings of Dettling.

Accordingly, applicants request favorable reconsideration of claims 1-39, 31-34 under 35 U.S.C. 103(a).

16. The Examiner further rejects claims 1-34 under 35 U.S.C. 102(b) or in the alternative, under 35 U.S.C. 103(a) in view of Nguyen ('636).

17. Applicants respectfully submit that in regard to the Examiner's rejection under 35 U.S.C. 102(b), "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegall Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 11226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). *MPEP 2131*.

18. The Examiner states that in regard to claims 1, 29, Nguyen discloses a catalyst comprising a support of lanthana and alumina impregnated with platinum.

Applicants respectfully submit that Nguyen teaches catalytic compositions comprising platinum and/or palladium, on an alumina support stabilized with alkaline earth metal and rare earth metal oxides, the composition having less than 1 wt.% ceria. Col. 5, lines 22-30. The present invention requires a catalyst comprising at least one metal oxide impregnated with at least one noble metal, the metal oxide selected from the group consisting of  $Fe_2O_3$ ,  $Cr_2O_3$ ,  $MgO$ ,  $ZnO$ ,  $TiO_x$ , a combination of  $Fe_2O_3$  and  $La_2O_3$ , and a combination of  $Fe_2O_3$  and  $CeO_2$ , the noble metal selected from the group consisting of Pt, Pd, Ir, Rh, and Ru, as is required in the present invention. Therefore, claim 1 is not anticipated by Nguyen.

Accordingly, applicants request favorable reconsideration of claim 1 under 35 U.S.C. 102(b).

Claim 29 requires a catalyst comprising a rare earth metal, a transition metal and a noble metal forming a compound having a stoichiometry represented by the formula  $AB_{1-x}M_xO_3$ , where x is 0-0.3. Nguyen teaches catalytic compositions comprising platinum and/or palladium, on an alumina support stabilized with alkaline earth metal and rare earth metal oxides, the composition having less than 1 wt.% ceria. Col. 5, lines 22-30. Nguyen does not teach a catalyst having the limitations required by claim 29. Therefore, claim 29 is not anticipated by Nguyen. Accordingly, applicants request favorable reconsideration of claim 29 under 35 U.S.C. 102(b).

19. The Examiner states in regard to claims 2 and 5, that Nguyen discloses 5% barium.

Applicants request favorable reconsideration of claims 2 and 5, for the reasons given above for claim 1, from which they depend.

20. The Examiner states in regard to claims 3-4 and 33-34, that Nguyen discloses 4% Pt and Pd.

Applicants request favorable reconsideration of claims 3-4 and 33-34, for the reasons given above for claims 1 and 29, from which they depend.

21. The Examiner states in regard to claims 6-28, that Nguyen discloses 5% lanthanum and barium oxides.

Applicants request favorable reconsideration of claims 6-28, for the reasons given above for claim 1, from which they depend.

22. The Examiner states in regard to claims 30, 31, that Nguyen discloses lanthanum, neodymium, and cerium oxide.

Claim 30 has been canceled.

Applicants request favorable reconsideration of claim 31 for the reasons given above for claim 29, from which it depends.

23. The Examiner states in regard to claim 32, that Nguyen discloses manganese.

Applicants request favorable reconsideration of claim 32, for the reasons given above for claim 29, from which it depends.

24. In regard to the Examiner's rejection of claims 1-34 under 35 U.S.C. 103(a) in view of Nguyen, applicants respectfully submit that the Examiner has failed to meet the burden of establishing a prima facie case of obviousness. In order to meet the burden of establishing a prima facie case of obviousness the Examiner must show (1) "some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings", (2) "a reasonable expectation of success", and (3) that "the prior art reference (or references when combined) must teach or suggest all the claim limitations." *MPEP § 2143*. "It is insufficient that the prior art disclosed the components of the patented device, either separately or used in other combinations; there must be some teaching, suggestion or incentive to make the combination made by the inventor." Northern Telecom, Inc. v. Data Point Corp., 15 USPQ 2nd 1321, 1323 (Fed. Cir. 1990).

Applicants respectfully submit that the Examiner has provided no suggestion or motivation for modifying Nguyen to obtain the claimed invention. Further, as discussed

above, Nguyen does not disclose all the claim limitations of claims 1-29, 31-34, and therefore there cannot be a reasonable expectation of success in obtaining the present invention by following the teaching of Nguyen.

Accordingly, applicants request favorable reconsideration of claims 1-39, 31-34 under 35 U.S.C. 103(a).

25. Applicants submit that all the claims in this application, being in order are now allowable and respectfully request favorable reconsideration.

Respectfully submitted,



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ACG/cw

Version With Markings To Show Changes Made

1. (Amended) A catalyst for converting NO<sub>x</sub> in exhaust gases to NH<sub>3</sub> comprising:  
at least one metal oxide impregnated with at least one noble metal, the metal oxide ~~comprises at least one~~ selected from the group consisting of Fe<sub>2</sub>O<sub>3</sub>, Cr<sub>2</sub>O<sub>3</sub>, MgO, ~~La<sub>2</sub>O<sub>3</sub>~~, ZnO, TiO<sub>x</sub>, wherein x is less than 2, a combination of Fe<sub>2</sub>O<sub>3</sub> and ~~La<sub>2</sub>O<sub>3</sub>~~, and ~~CeO<sub>2</sub>~~ a combination of Fe<sub>2</sub>O<sub>3</sub> and CeO<sub>2</sub>, the noble metal ~~comprising at least one~~ selected from the group consisting of Pt, Pd, Ir, Rh, and Ru.
2. (Amended) The catalyst of claim 1 further comprising at least one promoter metal oxide at an amount no more than 5 percent, wherein the promoter metal oxide ~~comprises at least one~~ is selected from the group of oxides consisting of Fe, Zn, Cu, Mo, Co, Ti, Ni, Cr, and V.
3. (Amended) The catalyst of claim 1 wherein the noble metal is present in an amount ~~between 0 percent and up to~~ 5 percent by weight.
5. (Amended) The catalyst of claim 4 wherein the at least one transition metal ~~comprises at least one~~ is selected from the group consisting of Cu, Zn, Ni, Mo, Ir, Co, Fe, Cr, and Mn.
7. (Amended) The catalyst of claim 6 wherein the at least one additional metal ~~comprises at least one~~ is selected from the group consisting of Cs, K, and Ba.
9. (Amended) The catalyst of claim 8 wherein the rare earth oxide ~~comprises at least one~~ is selected from the group consisting of La<sub>2</sub>O<sub>3</sub> and CeO<sub>2</sub>.
11. (Amended) The catalyst of claim 10 wherein the additional metal ~~comprises at least one~~ is selected from the group consisting of Cs, K, and Ba.
13. (Amended) The catalyst of claim 12 wherein the rare earth oxide ~~comprises at least one~~ is selected from the group consisting of La<sub>2</sub>O<sub>3</sub> and CeO<sub>2</sub>.
15. (Amended) The catalyst of claim 14 wherein the additional metal ~~comprises at least one~~ is selected from the group consisting of Cs, K, and Ba.

17. (Amended) The catalyst of claim 16 wherein the rare earth oxide ~~comprises at least one~~ is selected from the group consisting of  $\text{La}_2\text{O}_3$  and  $\text{CeO}_2$ .

19. (Amended) The catalyst of claim 18 wherein the rare earth oxide ~~comprises at least one~~ is selected from the group consisting of  $\text{La}_2\text{O}_3$  and  $\text{CeO}_2$ .

21. (Amended) The catalyst of claim 20 wherein the rare earth oxide ~~comprises at least one~~ is selected from the group consisting of  $\text{La}_2\text{O}_3$  and  $\text{CeO}_2$ .

23. (Amended) The catalyst of claim 4 further comprising at least one additional metal and at least one rare earth oxide, the additional metal and the rare earth oxide each present in an amount of at most 5 percent, the additional metal ~~comprising at least one~~ is selected from the group consisting of Cs, K, and Ba.

24. (Amended) The catalyst of claim 4 further comprising at least one additional metal and at least one rare earth oxide, the additional metal and the rare earth oxide each present in an amount of at most 5 percent, the additional metal comprising at least one selected from alkali metals and alkaline earth metals, the rare earth oxide ~~comprising at least one~~ is selected from the group consisting of  $\text{La}_2\text{O}_3$  and  $\text{CeO}_2$ .

25. (Amended) The catalyst of claim 5 further comprising at least one additional metal and at least one rare earth oxide, the additional metal and the rare earth oxide each present in an amount of at most 5 percent, the additional metal ~~comprising at least one~~ is selected from alkali metals and alkaline earth metals.

26. (Amended) The catalyst of claim 5 further comprising at least one additional metal and at least one rare earth oxide, the additional metal and the rare earth oxide each present in an amount of at most 5 percent, the additional metal ~~comprising at least one~~ is selected from the group consisting of Cs, K, and Ba.

27. (Amended) The catalyst of claim 5 further comprising at least one additional metal and at least one rare earth oxide, the additional metal and the rare earth oxide each present in an amount of at most 5 percent, the additional metal ~~comprising at least one~~ is selected from the group consisting of alkali metals and alkaline earth metals, the rare earth oxide ~~comprising at least one~~ is selected from the group consisting of  $\text{La}_2\text{O}_3$  and  $\text{CeO}_2$ .

28. (Amended) The catalyst of claim 5 further comprising at least one additional metal and at least one rare earth oxide, the additional metal and the rare earth oxide each present in an amount of at most 5 percent, the additional metal comprising at least one is selected from the group consisting of Cs, K, and Ba, the rare earth oxide comprising at least one is selected from the group consisting of  $\text{La}_2\text{O}_3$  and  $\text{CeO}_2$ .

29. (Amended) A catalyst for converting  $\text{NO}_x$  in exhaust gases to  $\text{NH}_3$  comprising:  
at least one compound represented by the a formula  $\text{AB}_{1-x}\text{M}_x\text{O}_3$ , wherein A is a rare earth metal, B is a transition metal, and M is a noble metal, and wherein x is in a range from 0 to 0.3.